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EXAMINER

WILSON, DONALD R

ART UNIT

PAPER NUMBER

1713

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8

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/807,069

Applicant(s)

NAKAGAWA ET AL.

Examiner

D. R. Wilson

Art Unit

1713

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 5, 10 and 19-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-9 and 11-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION*****Response to Restriction/Election of Species Requirement***

1. Applicant's election of the inventions of Group I, Claims 1-18, and the species of (a) poly(n-butyl acrylate as the main chain polymer, and (b) cinnamate as the chain termini, as described in Example 1, in Paper No. 7 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 19-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention. Claims 5, 10 and 15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected specie of the invention. Claims 1-4, 6-9 and 11-18 are under consideration.

***Claim Rejections - 35 USC § 112, First Paragraph***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. ***Claims 1-4, 6-9 and 11-18 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for vinyl polymers which are cross-linkable and contain more than one terminal alkenyl group, does not reasonably provide enablement for such vinyl polymers which contain only one such terminal group.*** The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims. The specification teaches at page 2, lines 11-15, that "--- a polymer having an alkenyl group at a molecular chain terminus undergoes crosslinking either by itself or in the presence of a curing agent ---", and the specification teaches that the alkenyl terminated polymers of the invention are for the purpose of cross-linking. The claims are further directed to vinyl polymers which only require one terminal alkenyl group, i.e., at least one. However, polymers having only one such group cannot enter into cross-linking reactions as taught in the specification, because cross-linking of a

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polymer chain requires reaction in at least two places, otherwise the polymer chain is merely linked to another entity as opposed to forming a network structure.

***Claim Rejections - 35 USC § 112, Second Paragraph***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. ***Claims 1-4, 6-9 and 11-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.***

7. The language of Claim 1 is indefinite because "R" is a univalent group and therefore cannot be a "bivalent organic group" as is set forth in the claim. ✓

8. The languages of Claim 2-3 are indefinite because it is unclear which "organic group in the general formula (1)" of Claim 1 is being referenced. ✓

9. Claim 7 is indefinite because "formula (1)" lacks antecedent basis in Claim 1.

10. Claim 13 is indefinite because "the metal complex catalyst" lacks antecedent basis. This may be overcome by reciting instead "a metal complex catalyst". ✓

11. Claim 16 is indefinite because it is unclear as to what is general formula (2). Applicant needs to place a "(2)" after the formula, as in the unamended claim. ✓

12. Claim 17 is indefinite because it is unclear what groups R<sup>22</sup> and R<sup>23</sup> are, and further how these groups are also connected to the vinyl monomer. The vinyl monomer also lacks clear antecedent basis. ✓

13. Claim 18 is indefinite because of the language "obtainable", which makes it unclear as to whether or not the polymer has been obtained by the cited reaction. It is suggested that the language "obtained" be used instead. ✓

***Claim Rejections - 35 USC § 103(a)***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. **Claims 1-4, 6-9 and 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP'036 in view of Mandal, Baudin, Muzyczko and/or Nishikubo.**

17. EP'036 discloses (meth)acrylate polymers prepared by atom transfer radical polymerization, wherein terminal halogen is converted to an alkenyl group (page 2, line 56 to page 3, line 7). Suitable (meth)acrylate polymers are those derived from n-butyl acrylate (page 4, lines 43-50), and n-butyl acrylate polymers are exemplified in the examples. Thus, a main chain butyl acrylate polymer would have been clearly envisaged by one of ordinary skill in the art. Conversion of the terminal halogen group to hydroxyl and subsequently to an alkenyl group is by reaction with an acid halide such as (meth)acryloyl chloride (page 7, lines 12-17). EP'036 doesn't appear to elucidate the range of acid halides which can be used other than to teach their use of introducing a terminal alkenyl group. However, as the purpose of introducing the terminal alkenyl groups is to make the polymers curable using a polyvalent hydrogen silicon compound, or by photo polymerization (page 2, lines 10-15), it would have been obvious to one of ordinary skill in the art to use acid chlorides containing alkenyl groups known to undergo such cross-linking reactions. Cinnamate groups are well known and used as photosensitive chromophores which undergo dimerization by exposure to UV radiation to form cross-links. Lacking a showing of criticality for compositions with cinnamoyl groups as the photo curable alkenyl group, it would have been obvious to one of ordinary skill in the art to use cinnamoyl chloride as the acid chloride in the process of EP'036 with the expectation of equivalent results to other known photo curable alkenyl groups. Examples of using cinnamate as a well-known photo curable group is shown, individually or collectively, by Mandal, Baudin, Muzyczko and/or Nishikubo.

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18. Mandal uses pendant cinnamate groups on non-linear optical compositions as a means of crosslinking them (col. 2, lines 26-46). The photodimerization reaction is shown schematically in Figure 1. Bauduin discloses acrylic telomers with pendant cinnamate groups which can be cross-linked by exposure to light (e.g., Claim 1). Muzyczko discloses photopolymerizable latex systems which employ a water soluble or dispersible polymer having at least two moieties per molecule that are sensitive to actinic radiation (¶ bridging col. 2-3). An example is an ethoxylated novolak which is reacted with cinnamoyl chloride (col. 8, lines 15-18). Nishikubo discloses photosensitive polymeric esters produced by the condensation of a chloromethyl group-containing polymer with a carboxyl salt such as an alkali metal salt of cinnamic acid (see title and claim 4).

19. In regards to the product-by-process claims, the claims are to the polymer, and as the main chain polymer is made by ATRP to produce polymers with narrow molecular weight distribution, and the same alkenyl groups are introduced at the terminal positions, it is not seen that the process of making the polymer is patentable over the compositions taught and/or suggested by the references.

When the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim it is appropriate for the examiner to make a rejection under both the applicable section of 35 USC 102 and 35 USC 103 such that the burden is placed upon applicant to provide clear and convincing factual evidence that the respective products do in fact differ in kind - *In re Brown*, 59 CCPA 1063, 173 USPQ 685 (1972); *In re Fessman*, 180 USPQ 324 (CCPA 1974) - and to come forward with evidence establishing unobvious differences between the claimed product and the prior art product. *In re Marosi* 218 USPQ 290.

#### **Objection to Title**

20. The title of the invention is not descriptive. It is so generic that it would relate to essentially all thermosetting compositions. A new title is required that is clearly indicative of the invention to which the claims are directed. ✓

#### **Objection to Abstract**

21. The abstract of the disclosure is objected to because it contains more than one paragraph. ✓  
Correction is required. See MPEP § 608.01(b).

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***Art of Interest/Technological Background***

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nakagawa'688 and Kitano disclose and claim compositions or processes for making compositions such as the instantly claimed accept that  $R^3$  in instant general formula (1) is hydrogen, which is not permitted in the instant invention.

***References Cited Search Report***

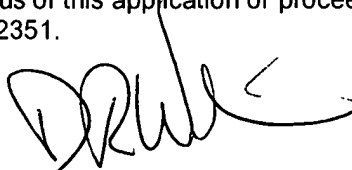
23. The references cited in the Search Report for the PCT application have been considered, but will not be listed on any patent resulting from this application because they were not provided on a separate list in compliance with 37 CFR 1.98(a)(1). In order to have the references printed on such resulting patent, a separate listing, preferably on a PTO-1449 form, must be filed within the set period for reply to this Office action.

***Future Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to D. R. Wilson whose telephone number is 703-308-2398.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 703-308-2450. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications. The unofficial direct fax phone number to the Examiner's desk is 703-872-9029.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-2351.



D. R. Wilson  
Primary Examiner  
Art Unit 1713